

Some backup to my Soviet cruise missile memo:

- Excerpt from NIE 11-12-80 that demonstrates that Soviets moved faster than we expected.
- Material on cruise missiles in latest NIE 11-3/8.
- Excerpts from recent book on cruise missiles by Richard Betts, showing how US advantage is featured, Soviet potential interest in own cruise missiles, issue of whether US will retain advantage.
- Excerpt from January 1981 SECDEF Report to Congress, featuring US cruise missile superiority as offset to Soviet numerical superiority.

*Larry*  
L. K. Gershwin  
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RICHARD K. BETTS  
*Editor*

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1981

# CRUISE MISSILES

*Technology, Strategy, Politics*

THE BROOKINGS INSTITUTION  
*Washington, D.C.*

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## INTRODUCTION

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# Innovation, Assessment, and Decision

RICHARD K. BETTS

TECHNOLOGICAL innovation traditionally plays a crucial role in American defense policy. In its military competition with the Soviet Union after World War II the United States used qualitative advantages in weaponry to compensate for Soviet quantitative advantages in manpower and, more recently, in some elements of nuclear forces. Military, budgetary, diplomatic, and political implications of technological advances, however, are seldom understood and often are not clear until long after new weapons have been deployed.

Ensuring that the full potential of weapon developments is realized and that their inadvertent negative consequences do not outweigh their benefits has become progressively more important. Modern weapon systems are more expensive than their predecessors, so each investment decision has a greater impact on defense capability than in the past. Furthermore, the United States faces an opponent with military power at least equal to its own; and its force posture also affects its relations with its allies. Yet cruise missiles have evolved without a well-defined conception of why they are needed, and without an assessment of their full implications. The programs illustrate how U.S. research and development sometimes operate independent of the policymaking process. Moreover, because there are several variants of the basic weapon, the cruise missile is an issue that cuts across normal jurisdictions in government organization. This makes full strategic assessment extraordinarily difficult.

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Cruise missile technology poses unique challenges for policy planning. First, the missile is extremely versatile, and expectations have expanded about the number of requirements it can fulfill across the nuclear and conventional spectrum of military missions. Second, the technology is maturing at a critical time in East-West relations. Tension has grown between the United States and Soviet Union, anxiety has risen about the military balance, and hopes have receded that negotiated solutions to arms competition will succeed. Third, because of the coincidence of the first two developments, the links between the military and political implications of the technology have become complex—and crucial.

Technological research, development, testing, and evaluation have progressed to the point that critical issues have begun to come into focus. Indeed, important decisions about the deployment of the cruise missile have already been made. Thus the time is particularly ripe for a comprehensive and detailed assessment of the benefits and problems. All of the commitments are not firm. Some are so politically delicate that they may be revised or even reversed. And decisions that are virtually irrevocable will require adjustments in other aspects of force posture and national policy. The technological innovation that provides new options, the strategic conceptualization that provides uses for those options, the political decisionmaking and diplomacy that resolve disputes about strategy, and the interaction among these categories must be evaluated together in order to make sense of the cruise missile's possible promise and disappointments.

### Technology: Innovation and Adaptation

The most revolutionary changes in U.S. strategic force posture after those associated with the atomic bomb came in the 1950s and 1960s because of the "confluence of several basic technological advances which came to maturity at more or less the same time—solid-fuel rocket propulsion, high yield-to-weight thermonuclear warheads, inertial guidance, compact solid-state electronics and computers, MIRV and re-entry technology."<sup>1</sup> In the latter part of the century, if exotic developments in directed energy research ever pan out, particle-beam weapons or laser weapons may present even greater changes, possibly shifting the strategic balance in favor of defensive systems. In the immediate future, however,

1. Harvey Brooks, "The Military Innovation System and the Qualitative Arms Race," *Daedalus*, vol. 104 (Summer 1975), p. 78.

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the principal weapon innovation is the cruise missile. (Major strategic systems such as the MX and D-5 ballistic missiles will not be available before the late 1980s.) This innovation is peculiar in that it combines new technologies with old, evolutionary rather than revolutionary developments, to yield novel options.

### *New Wine in Old Bottles*

The simple cruise missile (Germany's V-1 buzz bomb) made its debut in World War II.<sup>2</sup> The Allies had experimented with television-steered bombs<sup>3</sup>—forerunners of present-day precision-guided munitions—but matching of such sophisticated guidance developments with cruise missile vehicles was not to occur for decades. Crudely guided cruise missiles were developed and deployed in the 1950s but never appeared reliable or promising enough to compete with emerging ballistic missile systems. The Snark cruise missile, for example, was a fiasco: "The average miss distance was over 1,000 miles. At least one came down in the wrong hemisphere, disappearing somewhere in the interior of Brazil."<sup>4</sup>

What transformed the neglected cruise missile into an important part of U.S. defense programs was uncoordinated, integrative, and synthetic technological innovation, rather than a deliberate effort or an epochal breakthrough.<sup>5</sup> Several developments reaching fruition around 1970, par-

2. The Allied Supreme Commander, Dwight D. Eisenhower, claimed that if the Germans had perfected and used their V weapons half a year earlier the invasion of Europe might not have been possible. *Crusade in Europe* (Doubleday, 1948), p. 260. Defenses against the crude V-1 improved quickly, however, as the Allies used proximity fuses in anti-aircraft fire. According to the official history of the wartime Office of Scientific Research and Development, in the last four weeks of V-1 attacks, air defenses knocked down, respectively, 24 percent, 46 percent, 67 percent, and 79 percent of the incoming missiles. "On the last day in which a large quantity of V-1s were launched against British shores, 104 were detected by early warning radar but only four reached London." James Phinney Baxter 3d, *Scientists Against Time* (Little, Brown, 1950), pp. 234-35. The lack of institutional enthusiasm for cruise missiles is reflected in the wisecrack made by an Air Force officer: "Remember, the last side to use buzz bombs lost."

3. Baxter, *Scientists Against Time*, pp. 193-200.

4. Edmund Beard, *Developing the ICBM: A Study in Bureaucratic Politics* (Columbia University Press, 1976), p. 224, n. 15.

5. "The cumulative effect of many small evolutionary improvements in the parameters of component technologies can often be as revolutionary as . . . dramatic basic developments." Harvey Brooks, "The Military Innovation System," p. 78. Technological drift (J. P. Ruina's term), which results in spin-off benefits, "need not result from the decisions of higher authority or the formal R&D machinery at all. It involves minor improvements in systems and components, to cope with minor

## INNOVATION, ASSESSMENT, AND DECISION

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more survivable or penetrative than SLBMs, which it is not. To those who still consider assured destruction a criterion for sufficiency, the cruise missile should not appear vital except to the extent that its deployment might save money by forestalling more ambitious modernization programs, such as a new penetrating bomber and heavier and more accurate ballistic missiles.

The most obvious contribution of the cruise missile to U.S. force posture is in essential equivalence. In the 1980s, at least, the USSR will not have cruise missiles comparable to American models. By virtue of their newness, the manner in which they diversify modes of delivery, and their alleged capabilities for destroying hardened military targets (the limits of which are explored in chapter 5), the cruise missile should offset some of the apparent Soviet gains in the strategic balance derived from their massive advantage in ICBM throw weight. At a minimum, the ALCM will mitigate the perception of U.S. strategic inferiority by preserving the role of the bomber leg of the triad.<sup>32</sup> At a maximum, it will encourage the perception of a net increase in capability that will help plug the window of vulnerability before more impressive counterforce capabilities (the MX and D-5 ballistic missiles) become available. (Even if the ALCM is not a satisfactory quick fix it is the *only* fix aside from the Trident I C-4 SLBM currently programmed.) Whether or not such perceptions are warranted, they should be enhanced by the Soviet Union's vigorous complaints about the new threat they feel from the U.S. cruise missile.<sup>33</sup> And if the cruise missile prompts the Soviet Union to invest more heavily in

Wrong!

32. This was the principal consideration that led to earlier favorable assessment of ALCMs. See Alton H. Quanbeck and Archie L. Wood, with the assistance of Louisa Thoron, *Modernizing the Strategic Bomber Force: Why and How* (Brookings Institution, 1976). This study's conclusion that ALCMs could substitute for a new penetrating bomber (the B-1) by extending the efficacy of B-52s (or by allowing less capable carrier aircraft to perform similar missions by standing off beyond Soviet air defenses) was controversial. See Francis P. Hoerber, *Slow to Take Offense: Bombers, Cruise Missiles, and Prudent Deterrence* (Washington, D.C.: Georgetown University, Center for Strategic and International Studies, 1977); and Elmo R. Zumwalt, "An Assessment of the Bomber-Cruise Missile Controversy," *International Security*, vol. 2 (Summer 1977), pp. 47-58.

33. In anticipation of the 1979 NATO decision to deploy GLCMs, "a leading West German politician was told by an authoritative Russian that West German acceptance of the new arms would endanger the country's security 'more than Operation Barbarossa did.'" Flora Lewis, "Soviet Warns West on New U.S. Missiles," *New York Times*, November 23, 1979. *Window of vulnerability* refers to the period in the 1980s during which U.S. forces are in their lowest position relative to Soviet forces.

pects for which are discussed below). It should be stressed that the precise Soviet response (or, more likely, responses) may vary depending not only on the perceived military threats presented by ALCMs, GLCMs, and conventional and nuclear SLCMs, but also on the political-military context. In response to the NATO GLCM deployment, the Soviet Union may wish to deploy a new demonstrative matching offensive system. In the case of ALCMs, the response may be concentrated on devising appropriate air defenses. The Soviet Navy, on the other hand, may be designed and deployed not only to counter antiship cruise missiles, but also to counter potential land-attack SLCMs. Thus the advent of land-attack SLCMs might affect future Soviet fleet deployment patterns and, indeed, the composition of the Navy. In tactical terms, GLCMs (and SLCMs) may prompt increased attention to target acquisition and enhancement of preemptive capabilities. The Soviet Union seeks, even if countermeasures are not fully effective, to deny a "free ride" to any potential attack system or attacker.

Thus both in military and political terms, apart from possible attractions of new cruise missile technology to meet perceived Soviet military requirements, the advent of modern Western cruise missiles is virtually certain to elicit a wide range of Soviet military responses.

*This section is a complaint that U.S. may force Soviets to develop*

*cruise missiles. Despite this bias, makes some important observations.*

*However, mostly is a plea for arms control limits on U.S. cruise missiles.*

#### Soviet Views on Cruise Missiles and Arms Control

Apart from political and military and related economic responses to U.S. cruise missile programs, Soviet commentators also have expressed concern about the negative impact of cruise missile technology on future prospects for arms control. This concern is not limited to Soviet positions in strategic arms control negotiations (and related political maneuvering) aimed at inhibiting or limiting U.S. deployment of cruise missiles. For such bargaining, the USSR would have to relinquish comparable opportunities, and given the disparity in interest and achievement in cruise missiles, might also have to make concessions on other matters. The Soviet Union has clearly indicated its readiness at least to accept reciprocal limitations in order to head off some American programs. These Soviet apprehensions about the impact on future arms limitation and other arms control interests warrant further attention.

The Soviet Union argues that, above all, cruise missile systems will present insurmountable difficulties for verification—in the words of one

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leading Soviet analyst, difficulties so severe that they "would hinder or even preclude arms limitations."<sup>34</sup> This objection is particularly addressed to GLCMs and SLCMs<sup>35</sup> because they are small, mobile, and easily camouflaged,<sup>36</sup> and also because "it is impossible to distinguish strategic cruise missiles from tactical ones by their external features."<sup>37</sup>

One can speculate on the extent to which the Soviet leaders are disturbed about possible obstacles to future arms limitations posed by cruise missiles and the extent to which they see this as an argument that would appeal to Western audiences who might oppose such programs for that reason. Given, however, the strong Soviet interest in limiting U.S. SLCM and GLCM deployments, and in particular the expressed interest in LRTNF arms limitation negotiations, it is quite probable that at least some Soviet officials are indeed troubled about the prospect that U.S. cruise missile development and deployment will prejudice possible future negotiated limitations. This point was included in Secretary General Leonid Brezhnev's authoritative report to the Twenty-sixth Congress of the Communist Party of the Soviet Union in 1981, when he noted that "rapid and profound changes are occurring in the development of military technology. Qualitatively new types of weapons, primarily weapons of mass destruction, are being developed—types of weapons that can make control over them and therefore also their agreed limitation extremely difficult if not impossible." In the same speech, Brezhnev proposed a moratorium on deployment in Europe of medium-range weapon systems, specifically including "ground-based strategic cruise missiles."<sup>38</sup>

Proliferation of cruise missile technology to other countries is another important source of Soviet uneasiness. Although undoubtedly the Soviet Union would have liked to preclude possible U.S. transfer of cruise missile technology to its allies in the SALT agreement, that was not acceptable to the United States. The Soviet Union remains concerned about such transfer, even if only for delivery of conventional weapons. Soviet

34. Georgy A. Arbatov, "US Foreign Policy on the Threshold of the Eighties," *SShA*, no. 4 (April 1980), p. 50; see also Arbatov, *Radio Moscow*, May 2, 1980, in FBIS, *Daily Report: Soviet Union*, May 3, 1980, pp. A1-A2; and Sobakin, *Resheniya*, p. 44.

35. See Boikov, "Cruise Missiles and Futile Hopes," p. 13; Nechayuk, "The Pentagon Steps Up the Arms Race"; and Shaskol'sky, "One More Guided Missile."

36. Boikov, "Cruise Missiles and Futile Hopes."

37. Nechayuk, "The Pentagon Steps Up the Arms Race."

38. L. I. Brezhnev, "Report of the C.P.S.U. Central Committee to the XXVI Congress of the C.P.S.U. and the Immediate Tasks of the Party in the Fields of Domestic and Foreign Policy," *Pravda*, February 24, 1981.

leaders also believe that other states will be tempted to develop cruise missile technology, compounding Soviet defense requirements.<sup>39</sup>

Another specific concern expressed is the heightened risk of accidental outbreak of war. One Soviet commentator noted that the false November 6, 1979, North American Air Defense (NORAD) alert warning of a Soviet missile attack on the United States was triggered by an error in programming the wrong computer with a simulation tape for training—an error that was discovered and corrected only after six minutes. But, in the Soviet view, Eurostrategic missiles, including land-based cruise missiles, “do not afford that opportunity” because they can reach targets in a matter of minutes.<sup>40</sup> This argument is evidently more applicable to the Pershing II MRBM with its flight time of only about five minutes to Soviet territory; the Soviet Union has stressed that fact, but as noted above, the argument has also been extended to GLCMs inasmuch as they may escape timely detection.

### Potential Future Soviet Interest in Cruise Missiles

At present, the Soviet Union would prefer to reach an arms limitation agreement with the United States to ban long-range GLCMs and SLCMs, as would temporarily have been done until the end of 1981 under the protocol to the 1979 SALT II treaty, and to limit ALCMs, as would have been done by that treaty if it had been ratified. Regardless of the fate of the SALT II treaty and protocol, the Soviet Union at this point would probably be prepared in any negotiation to give up prospects for these weapons if the United States would also agree to do so. In view of the fact that the United States is proceeding with a substantial ALCM program and has forged a NATO decision to proceed in the mid-1980s with deployment of intermediate-range GLCMs, the Soviet leaders must recognize that the chances for agreement on a ban on GLCMs are slim indeed, and on ALCMs virtually nil. There is not much more prospect for banning SLCMs given the momentum of such programs and the current hiatus and future uncertainty with respect to strategic arms limitation negotia-

39. Vinogradov and Berezin, “The Pentagon’s Dangerous Actions”; and “The Task of Limiting Strategic Arms: Prospects and Problems,” *Pravda*, February 11, 1978.

40. Boikov, “Cruise Missiles and Futile Hopes,” p. 13.

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tions. The numbers of launchers for such weapons might be limited by a negotiated agreement if adequate verification could be provided.

No evidence exists, at least on public record, to indicate active Soviet development of strategic long-range ALCMs, SLCMs, or GLCMs based on technology comparable to that being developed by the United States. The Soviet Union has continued to develop improved short- to medium-range air-launched and sea-launched cruise-missiles based on traditional technology. Soviet military leaders are actively following U.S. development of advanced cruise missile weapons, if only to be abreast of their capabilities and to design countermeasures. They may also be, or become, interested in acquiring such systems.

### ALCMs

A truly strategic standoff ALCM would have been less likely to be developed by the Soviet Union if the SALT II treaty had been ratified. Under the 1979 treaty, the United States and the USSR would have been allowed, under a 1,320 subceiling, any combination of strategic missiles equipped with MIRVs—ICBMs, SLBMs, and air-to-surface ballistic missiles (ASBMs)—and heavy bombers equipped with ALCMs with a range greater than 600 kilometers. Because there would have been a further subceiling of 1,200 for MIRV-equipped ICBMs, SLBMs, and ASBMs, in effect there would have been a "free ride" for 120 ALCM-carrying heavy bombers (although in place of 120 other strategic launchers). Additional ALCM-carrying heavy bombers beyond 120 could have been deployed but only in substitution for MIRV-equipped ICBMs, SLBMs, or ASBMs. ALCMs were also limited to no more than 20 on each existing type of bomber, and in the future if new carriers were introduced to an overall average of 28 per carrier. There were no maximum-range restrictions; all ALCMs with ranges over 600 kilometers would have been included, as would any bomber carrying such ALCMs. Testing or deployment of ALCMs equipped with MIRVs also would have been banned.

The low density of air defenses of the continental United States might reduce the perceived need for ALCMs. On the other hand, ALCMs could extend the combat radius of the heavy bomber fleet. ALCMs might extend significantly the strategic potential of Backfire (Tu-22M) medium bombers. (This could not have been done under the SALT II treaty.

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which would have banned ALCMs with ranges above 600 kilometers from all except heavy bombers, without further reducing existing forces, because testing and equipping the Backfire with such ALCMs would have converted it to a recognized heavy bomber type and brought Backfire under the overall ceiling.) Without the constraints of the SALT II treaty, however, the Soviet Union might expand its Backfire fleet and equip some Backfires, Bears, and follow-on heavy bombers with ALCMs.

#### *SLCMs*

The Soviet Union, with a long and active history of cruise missile deployment on submarines and surface ships, is continuing to improve tactical antiship systems of various ranges. It is possible that the USSR will develop an interest and a capability in strategic land-attack SLCMs. It would probably be misleading, however, to assume that because there are many Soviet surface and subsurface naval platforms and tubes they would necessarily be converted to a land-attack role. The Soviet Union has extensive antiship torpedo and cruise missile launchers because of perceived requirements. Moreover, as the U.S. Navy expands (and if it develops an additional SLCM strategic role) the Soviet Union is likely to see its antiship requirements rise rather than fall. In short, strategic SLCMs will have to compete with other naval weapon systems rather than simply inherit their assets.

One possible outcome of any emerging Soviet naval interest in land-attack SLCMs might be authorization for such a system to be used against port and naval base targets. This would be focused on a long-standing naval target requirement, which might be conceded without a bureaucratic struggle as extensive as a strategic SLCM concept could prompt, although this, too, could engender opposition from the Naval Aviation and the ballistic missile-launching submarine components now probably sharing in this mission.

Notwithstanding the caveats discussed above, a Soviet strategic land-attack SLCM could significantly enhance Soviet capabilities and might be developed and deployed. Such a system would be able to take advantage of the geographical asymmetries of the two countries, and even a modest medium- or intermediate-range SLCM force could threaten a wide range of military and other targets in the United States. It would add a new dimension to the attack threat against the continental United States, even

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though a redundant one. It could also augment SLBMs in hedging against the growing U.S. counterforce threat to the fixed land-based Soviet ICBM force.

*GLCMs*

The failure of previous Soviet land-based cruise missile systems to compete successfully with ballistic missiles in the 1950s and 1960s may not augur well for the future prospects of GLCMs. To be sure, substantial differences in cost and effectiveness could bring a different outcome. Another serious competitor will be the Frontal Aviation (the tactical air arm), which has been substantially upgrading its conventional and nuclear attack capabilities, and probably also the Long-Range Aviation (the strategic air force), most of which comprises medium bombers assigned to conventional and nuclear strike missions in a given theater.

The deployment of large numbers of nuclear-armed GLCMs in NATO in the 1980s, as currently planned, will not only stimulate the USSR's review of its plans and posture to assure no degradation in capability in the European theater, but will also raise the question of demonstrative counterdeployments. This is especially the case given the Soviet view that the Western move is intended to upset an existing parity and balance. Whether these countermeasures will include Soviet GLCMs is, however, uncertain—the Soviet decision is not known to the United States, and in all probability the decision has not yet been made in Moscow.

Despite the above considerations, unless GLCM deployment is curbed by negotiated arms control, it is highly likely that the Soviet Union will eventually deploy large numbers of GLCMs in Europe, the Far East, and southern USSR.

## Concluding Observations

The U.S. approach to the new cruise missile technology, as is discussed elsewhere in this book, has been affected by the political-military strategic context and by domestic U.S. and allied institutional and political considerations. The evolving strategic relationship between the United States and the Soviet Union has in recent years been characterized by an unprecedented emergence of overall strategic parity and also by an unprece-

dented role for arms control. Arms control in the 1980s may, however, be of less concern than it was in the 1970s, and in any event the attention that has been given to arms control implications of cruise missile technology has been directed more to possible limitations on current systems than to future developments. Also, the significance for the Soviet Union of the theater nuclear situation in Europe and of the implications of the cruise missile technology for that situation has not been given sufficient attention in the West. The United States and NATO have seized upon this available technology to help redress a perceived Western shortcoming in the theater nuclear balance. In dealing with this current political-military problem, the impact on Soviet programs or on arms control prospects has been given less attention.

The Soviet perspective on advanced cruise missile technology is still in a formative stage. The Soviet Union has reacted to a situation in which the United States has a clear lead in development and deployment plans and decisions, and this has reinforced Soviet preferences for restraint and negotiated arms control. But as U.S. deployment proceeds, and as opportunities for arms control diminish, Soviet preferences will shift toward acquisition of advanced cruise missiles and their adaptation to Soviet military requirements (as well as engendering other Soviet countering or offsetting military and diplomatic measures). The concern that the Soviet Union has about some features of the new technology (such as counterforce applications, increased defensive outlays, and potential spread to other countries) will be accommodated, and the Soviet Union will seek ways to capitalize on the new technology to serve its needs and interests.

The attraction of cruise missile technology, especially GLCMs and SLCMs, which is based in part on apparent lower cost and early availability for new high-performance weaponry, may be leading to decisions in the early 1980s that the West will regret by the end of the decade. Eventual Soviet deployments of GLCMs, possibly on a massive scale, would more than wipe out any gains of early NATO deployment. Similarly, long-range land-attack SLCMs could add new perceived threats to Europe, North America, and in the third world, far outweighing the value of the addition of this weaponry to Western arsenals. Perhaps there is no alternative. But this is far from clear, given the current Soviet interest in arms control of this technology. It would be most unfortunate if the West, by assuming that no constraints were possible, became responsible for that very outcome.

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significantly increased Western striking power if Britain and France were to acquire cheap cruise missiles. Although many on this side of the Atlantic doubt it, one can argue that it is in the American interest that these allied forces remain viable. As U.S.-Soviet nuclear parity has eroded the credibility of American extended deterrence, it has become more advantageous to reinforce Soviet doubts that a conventional attack could succeed without precipitating nuclear retaliation. Multiplying the number of independent decision centers capable of launching nuclear weapons contributes to this reinforcement.

Hopes for stabilizing the arms race, however, create an American interest in not making these independent deterrents appear to be too highly effective. A profusion of cruise missiles that could cover more targets than SLBMs (whose numbers are limited by platform costs) might have done this. If so, and if the Soviet response was a stronger effort to match or exceed the combined total of Western forces, the result would rebound against conservative American calculations of advantage. Extremely cautious planners would then focus on the *disadvantage* of dispersing the allied deterrent across several independent forces. In a nuclear war release of *all* those forces would be less likely, so the USSR would be suspected of having "escalation dominance in detail." Fragmented command is useful for deterrence credibility, but unitary command is more credible for effectiveness in actual force employment. If any of this makes sense, then, it may be propitious that the British decided for Trident instead of cruise missiles, even if worries about the prelaunch survivability or vulnerability to Soviet air defenses of cruise missiles were unfounded.<sup>26</sup>

## *Soviet Cruise Missiles—Threat or Relief?*

Another question that bears on the security implications of U.S. investment in cruise missiles is the probable Soviet response discussed by Garthoff in chapter 11. What would be the strategic consequences if the USSR decided to deploy ALCMs of its own? This issue has received scant

26. As long as British or French nuclear doctrine rests on finite deterrence and countervalue targeting, MacDonald, Ruina, and Balaschak's assessment of high cruise missile penetrativity against city-size target areas would deflate some of the arguments about the probable attrition of a limited cruise missile force unless the target list was large (say, forty cities). In chapter 14, however, Freedman notes that prelaunch survivability was a major concern (since the restricted deployment areas available to GLCMs could be barraged), and Ian Smart's calculations showed SLCMs to be less cost-effective than SLBMs in terms of deliverable megatonnage.



attention in strategic discourse. Modern long-range cruise missiles could make the intercontinental capability of the Backfire unambiguous. The Soviet Union has also reportedly been developing a new long-range bomber to replace its ancient Bears and Bisons.<sup>27</sup>

If Moscow's choice was between augmenting its forces with cruise missiles or not augmenting them at all, the United States obviously should view the prospect of Soviet cruise missiles with alarm. Conceivably this could happen if the Soviet decision was spurred by a desire to respond to the qualitative Western innovation rather than by cold strategic calculation of military requirements. In this case, if U.S. restraint could forestall a Soviet venture into a whole new dimension of weaponry, one might argue for more Western flexibility in the scale and timing of cruise missile deployments in the hope of reaching an arms control agreement that could satisfy U.S. and NATO requirements without driving the Russians into the cruise missile game. If one believes that Soviet decisions are determined primarily by careful strategic judgment, however, the desirability of cruise missiles will probably be measured against the apparent utility of alternate weapon choices and a decision will be subordinate to a more general determination of desired force levels. Soviet cruise missiles would then be less worrisome to the West.

Analysts who interpret U.S.-Soviet arms competition in terms of an "action-reaction" model might rate the chances of a Russian move toward cruise missiles as quite high. They would argue that a major self-defeating fault in some previous innovative U.S. programs (such as MIRV) was the failure to look ahead to the next stage, when Soviet imitation would neutralize the advantage or increase the threat. An action-reaction prediction, however, would not in itself be compelling. Consider the earlier difference in American and Soviet interest in old naval cruise missiles. The comparative U.S. lack of interest was due to the asymmetry of the two nations' naval missions and force structures. The reversal of interest when it came to modern long-range cruise missiles can also be understood in terms of larger trends and traditions in the organization of the countries' strategic forces. As the dominance of aircraft carriers discouraged early U.S. commitment to antiship cruise missiles, the dominance of the strategic rocket forces and ballistic systems discouraged Soviet commitment to air-breathing intercontinental delivery vehicles. The USSR did not emulate U.S. Air Force attachment to intercontinental bombers in its own strategic buildup.

27. George C. Wilson, "Soviet Bomber Development Reported," *Washington Post*, June 27, 1979.



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# COMPLEXITIES, UNCERTAINTIES, AND DILEMMAS

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Of course, the U.S. Navy now favors the Tomahawk antiship missile (TASM), and the Soviet Union might be driven toward ALCMs, not out of emulation but perhaps for the same reasons that concern American strategists: vulnerability of fixed ICBMs (although it would be just as likely that the USSR would respond, like the United States, by developing mobile ICBMs). There have indeed been some public indications of Soviet development of an ALCM.<sup>28</sup> Even inferior ALCMs on new Soviet bombers could be a credible threat against the continental United States, since U.S. air defenses are very weak.<sup>29</sup>

Does this mean that the United States should consider potential Soviet deployment of ALCMs a severe military danger? No. They would simply be a redundant threat in a first strike.<sup>30</sup> Indeed, the principal reason that Washington dismantled much of the U.S. air defense system is that the Russian ICBMs made the Soviet bomber threat only incidental. As long as the Soviet ICBM force remained substantial, ALCMs would not change that reasoning, unless it was assumed that increased air-breathing forces would offer significant options for a limited Soviet attack that would make U.S. air defense investments significantly more attractive. Washington should certainly prefer Soviet deployment of ALCMs to additional ballistic missiles. And if cruise missiles served only to buttress Soviet second-strike capabilities, so much the better for the stability of mutual deterrence. That, after all, is the popular justification for why the USSR should not see American slow-flying ALCMs as a threat to stability. It is true that Soviet cruise missile deployments might be less susceptible to U.S. intelligence monitoring. But the idea that "the threat we know" is preferable to one we do not know is questionable if the technical capabilities of the former (modern large ballistic missiles) are more dangerous.

28. When asked during Senate testimony whether the USSR had an ALCM in research and development, Chairman of the Joint Chiefs of Staff David Jones replied, "We have some very limited evidence that I would not like to discuss in open session." *Military Implications of the Treaty on the Limitation of Strategic Offensive Arms and Protocol Thereto (SALT II Treaty)*, Hearings before the Senate Armed Services Committee, 96 Cong. 1 sess. (GPO, 1979), pt. 1, p. 294.

29. Huisken, *The Cruise Missile and Arms Control*, p. 51.

30. Some have suggested that blind spots in U.S. radar coverage could allow Soviet bombers to sneak through in a surprise strike. The risks to the Russians in such a plan, if it were not simply complementary to an ICBM attack, would be extreme. If it was complementary, the incremental threat to U.S. targets would be small. One scenario sometimes cited to justify concern is that the bombers could sneak through before ICBMs were launched, striking command and communications targets and bomber bases and preempting U.S. capacity to launch forces on warning.

Some observers worry about the budgetary pressure that might result if Soviet cruise missiles prompted stronger interest in continental air defense. This might be significant politically if larger Soviet air-breathing forces highlighted the disparity in air defense, but it would not change the military reasons for Western limits on such defenses as long as vulnerability to Soviet ballistic missiles is so great. The relative cost-benefit attractiveness of diverting U.S. resources back to air defense would vary directly with the extent to which Soviet ALCM deployments *replaced* more worrisome ICBMs. In that context incentives to improve defenses would be no more worrisome than welcome. Fear of the USSR's investment in cruise missiles would rest on the assumption that its alternatives were either adding ALCMs and increasing the threat or keeping the threat at the present level. It is more likely that the choice would be between adding cruise missiles or adding ICBMs; the latter would be worse for the United States.

Similarly, for theater nuclear deployments Soviet GLCMs would be less threatening to NATO than a comparable number of additional SS-20s. (By the same token, it is unclear what the military attractiveness of cruise missiles over SS-20s would be to Soviet planners. Unlike NATO Moscow does not need the increased range of cruise missiles to broaden its coverage of European targets.) When the nuclear alternatives are considered—for either replacement or additions to force levels—it is reasonable to argue that in military terms the West should encourage a Soviet move from ballistic to cruise missiles. This felicitous conclusion, however, may not carry over to the realm of conventionally armed cruise missiles. If Moscow matches Western investments in such systems (already of tenuous potential cost-effectiveness), the improvements such systems promise for NATO's position in the conventional military balance might well be neutralized. More than the technically different force elements in the strategic nuclear area, conventional cruise missiles offer as much for initiative and counterforce war-fighting as they do for retaliation and deterrence. If the Russians use conventional cruise missiles to threaten airfields in Western Europe and to interdict reinforcement choke-points more effectively (as Palin's suggestions in chapter 6 aim to do against the Warsaw Pact countries), the United States will be just as hampered in prosecuting a war as the Soviet Union will. As one anonymous defense expert said, "If it's cheap for us, it's cheap for them."<sup>31</sup>

31. Quoted in David Fouquet, "Cruise Missile: Launcher for Next Arms-Control Talks?" *Christian Science Monitor*, December 17, 1979.

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Arms control complements our own defense programs by limiting the threats our military forces must deter or defeat. Two examples will help illustrate the general point. First, it would be both more difficult and more expensive for us to plan, develop, and deploy our strategic nuclear forces if the Soviets were not subject to SALT constraints, for in that case, Soviet forces, in virtually every measurable dimension, could be larger, more powerful, and less susceptible to monitoring than they would be under the terms of the SALT II Treaty. Second, our task of security planning to protect our interests in Southwest Asia, the Middle East, or the Far East, for example, would be considerably greater were additional countries, beyond those who now have nuclear weapons, to develop and deploy them.

Arms control proposals are not ends in themselves; they should be evaluated in terms of their contribution to our security goals, their foreign policy implications, and their arms control rationale. If agreements meet these standards, the United States should be willing to reduce or limit U.S. capabilities where those of the Soviets or other potential adversaries are appropriately limited. But we must always be able to meet our security objectives even if we reach no such agreements, or in case an agreement might be abrogated. To preserve the viability of existing arms control agreements, we must maintain: adequate intelligence to monitor compliance, appropriate hedges to permit us effective responses to detection of violations (should they occur), and strict U.S. observance of applicable limits, which, among other things, facilitates vigorous protest of possible violations.

#### E. U.S. Advantages

We should exploit fully such advantages as geography, the strengths of our allies, and an advanced technology that can both contribute significantly to our military capabilities and impose additional costs on our adversaries. Some of these advantages are the opposite side of the coin of the Soviet weaknesses I discussed in Chapter 2, but two deserve highlighting here.

One significant U.S. advantage is the voluntary nature of our Alliance. Our allies have freely chosen to associate with us in a coalition, whereas the loyalty of the non-Soviet Pact nations is subject to question. Our allies, unlike those of the Soviets, make significant contributions to combined military capabilities. For example, our European allies would contribute 60 percent of NATO's tactical aircraft, 60 percent of its tanks, and 80 percent of its manpower--after mobilization. Japan has three times as many destroyers as the U.S. Seventh Fleet, more combat aircraft than the U.S. Fifth Air Force, and a larger ground force than the United States maintains in the entire Far East. And in any reasonably likely European or Japanese war scenario, our allies would be fighting to defend their homelands and their own freedom, an intangible factor, but one that could make a decisive difference in the outcome of a war.

U.S. technological advantages in certain key fields are significant and widely recognized. It is essential that we maintain these technological leads, in part because it is neither realistic nor necessary for the United States to match the Soviets quantitatively--gun-for-gun, tank-for-tank, or missile-for-missile--because of the enormous commitment in terms of military manpower and operational costs that would be required, and because our objectives, strategies, and tactics are quite different from theirs.

Let me illustrate this general point with the case of ground forces. The Soviets have a substantial advantage in numbers of troops and of armored assault vehicles. Therefore, we need to develop greatly improved anti-armor weapons for our ground forces and to maintain air superiority in order to deny the Soviets air cover for an armored attack.

We are developing, as fast as we can, a third generation of precision guided munitions--anti-tank missiles. These new weapons, which will be direct-hit, all-weather, fire-and-forget systems, will have a revolutionary impact when they are built and deployed in about the mid-1980s. In the meantime, we are pushing hard on the production of new second generation laser-guided systems such as COPPERHEAD and HELLFIRE, and we are improving the anti-armor weapons already deployed, particularly the TOW anti-tank guided missile. Both of these changes should be incorporated in field equipment in a year or two.

It is also crucial that we maintain air superiority. We judge that we have it today because our airplanes and pilots are superior to those of the Soviets, although their numbers are somewhat greater. But the Soviets are introducing new airplanes that are sophisticated and very capable. We still expect to have some advantage in airplane performance in the mid-1980s, but it will be a narrower edge and may not by itself be sufficient to compensate for the quantitative advantage the Soviets will have by then.

Another classic example of the application of high technology to weapons development and military capability is the long-range, air-launched cruise missile (ALCM), a remarkable weapon system whose future contributions to U.S. strategic capability are clearly depicted in the strategic balance charts in Section I, Chapter 4. The ALCM's ability to penetrate even the most modern Soviet air defenses derives from the combination of five underlying technologies: guidance, warhead, propulsion, low observables, and micro-electronics. The net result is a weapon system that is small enough that a B-52 can carry 20 of them and accurate enough to destroy very hard targets using only a small warhead. Thus we can rely on many small ALCMs rather than fewer, larger B-52s as the means to penetrate Soviet defenses. Moreover, the ALCM is very difficult to detect and track. Once deployed, the ALCM could render the multi-billion dollar, massive Soviet air defense system obsolete.

## II. NATIONAL MILITARY STRATEGY

Our basic strategy is deterrence, across the entire spectrum of conflict. Deterrence is a function of three factors: military capabilities, the will to use them, and a potential aggressor's perception of the first two. Thus, implicit in deterrence is the demonstrated ability and determination, should deterrence fail, to deny an aggressor its objectives or to retaliate so as to prevent it from gaining more than it would lose at any level of conflict--from a strategic nuclear exchange, through a major European war, down to small scale aggression that would threaten major U.S. interests in other parts of the world. The third factor, the perceptions of those we seek to deter, must not be overlooked or discounted. That is why, as I have warned on earlier occasions, inaccurate, disparaging, and misleading charges about either our national will or our military capabilities damage our security in fact by compromising deterrence.